

REMARKS

This is a full and timely response to the non-final Official Action mailed **August 25, 2009** (the "Office Action" or "Action"). Reconsideration of the application in light of the following remarks is respectfully requested.

Claim Status:

Under the imposition of a previous Restriction Requirement, claims 1-31 and 40-59 were withdrawn from consideration. To expedite prosecution of this application, these claims have been cancelled without prejudice or disclaimer.

Further, in a previous office action claims 37-39 and 60-64 were also alleged to be drawn to nonelected species according to the previous Restriction Requirement, and were therefore withdrawn. Applicant will be entitled to rejoinder of any withdrawn dependent claims upon the allowance of any corresponding independent claims. MPEP § 821.04.

Thus, claims 32-36, 61, 62 and 65-72 are currently pending for further action.

Prior Art:

Claims 32-36, 61, 62 and 65-72 were all rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent App. Pub. No. 2003/0235335 to Yukhin et al. ("Yukhin"). For at least the following reasons, this rejection should be reconsidered and withdrawn.

As an initial matter, Applicant notes that Yukhin has not been shown to be valid prior art against the present application. The present application claims priority to Provisional Patent

Application No. 60/431,611 filed December 5, 2002. In contrast, the Yukhin reference is an application filed March 31, 2003 *after* Applicant's priority date.

Yukhin does include a claim to priority from an earlier Provisional Patent Application No. 60/383,216 filed May 22, 2002. However, there is no showing on the record that that provisional patent application included any of the subject matter for which the current Action cites to Yukhin. Applicant is unable to access the content of Yukhin's provisional patent application through PAIR. Consequently, the burden is on the Office to demonstrate that the Yukhin's provisional patent application taught all the subject matter for which Yukhin is cited against Applicant's claims. Until such a showing is made on the record, Yukhin effective priority date is after that of Applicant, and Yukhin cannot be considered valid prior art.

Claim 32:

Independent claim 32 recites:

A high speed 3D surface imaging camera comprising:  
a light projector for selectively illuminating an object, said light projector being configured to project ***three sequential light beam projections having different colors*** and different spatially varying intensity patterns from said projector onto said object; and  
an image sensor configured to receive reflected light from said object and to ***generate three separate color image data sets based on said three sequential, differently colored, variable intensity pattern light beam projections***, said three separate color image data sets providing said 3D image data of said object.  
(Emphasis added).

In this regard, the Office Action cites to Yukhin at paragraphs 0054 and 0060-63. (Action, p. 3). According to the Action, Yukhin teaches "said light projector (401) being configured to project three sequential light beam projections having different colors (light source

510A-510N) and different spatially varying intensity patterns (SLMs 515A-515N).” (*Id.*). This is incorrect.

Yukhin actually teaches the following.

Light sources 510A-510N may generate light beams. In at least one embodiment, one or more light source 510A-510N can generate light of a different spectral range, for example, ranges of the ultraviolet, visible and infra-red spectra of electromagnetic radiation. Thus, in one such embodiment, light from one to N spectral ranges may be projected on object 560 from the exemplary illuminating unit.  
(Yukhin, paragraph 0062).

Thus, Yukhin does not teach or suggest the claimed light projector configured to project “three sequential light beam projections having different colors.” (Claim 32). Rather, Yukhin teaches using a light source in each of the ultraviolet, visible and infra-red spectra, not three different colors as claimed.

Moreover, Yukhin never teaches or suggests the claimed light projector that projects the light beams *sequentially*, i.e., “three sequential light beam projections having different colors.” (Claim 32). The Office Action fails to even address this point.

Respectfully, to anticipate a claim, a reference must teach each and every element of the claim, and “the identical invention must be shown *in as complete detail as contained in the ... claim.*” MPEP 2131 citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989) (emphasis added). Moreover, “[t]he prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’”

*NetMoneyIn v. Verisign*, (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542 (Fed. Cir. 1983)).

In the present case, Yukhin clearly does not disclose the claimed invention with each and every claimed element in the same amount of detail or as arranged in the claim. Consequently, because Yukhin clearly fails to satisfy the requirements for anticipating claim 32, the rejection of claim 32 and its dependent claims should be reconsidered and withdrawn.

Claim 65:

Claim 65 recites:

A 3D imaging camera comprising:

a light projector for selectively illuminating an object, said light projector being configured to project a number of sequential light beam projections having different wavelengths and different spatially varying intensity patterns from said projector onto said object; and

an image sensor configured to receive reflected light from said object and to generate a number of separate image data sets based on said number of sequential light beam projections, said separate image data sets providing said 3D image data of said object.

(Emphasis added).

As noted above, Yukhin never teaches or suggests the claimed light projector that projects the light beams *sequentially*, i.e., “said light projector being configured to project a number of sequential light beam projections having different wavelengths and different spatially varying intensity patterns from said projector onto said object.” (Claim 65) (emphasis added). The Office Action fails to even address this point.

Respectfully, to anticipate a claim, a reference must teach each and every element of the claim, and “the identical invention must be shown *in as complete detail as contained in the ...*

*claim.*” MPEP 2131 citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989) (emphasis added). Moreover, “[t]he prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *NetMoneyIn v. Verisign*, (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542 (Fed. Cir. 1983)).

In the present case, Yukhin clearly does not disclose the claimed invention with each and every claimed element in the same amount of detail or as arranged in the claim. Consequently, because Yukhin clearly fails to satisfy the requirements for anticipating claim 65, the rejection of claim 65 and its dependent claims should be reconsidered and withdrawn.

Additionally, various dependent claims of the application recite subject matter that is further patentable over the cited prior art. Specific, non-exclusive examples follow.

Claim 32:

Claim 32 recites “wherein said plurality of CCD sensors comprises 3 CCD monochromatic sensors.” However, as demonstrated above, Yukhin teaches light sources operating in three different spectral ranges, i.e., ultraviolet, visible and infrared. This clearly teaches away from the claimed “3 CCD monochromatic sensors” of claim 32. For at least this additional reason, the rejection of claim 32 should be reconsidered and withdrawn.

Claim 35:

Claim 35 recites: “[t]he high speed 3D surface imaging camera of claim 32, further comprising a computing device communicatively coupled to said image sensor wherein said computing device is *configured to combine said separate color image data sets into a composite Rainbow-type image of said object*. (Emphasis added). In this regard, the current Office Action cites to Yukhin at paragraphs 0070-0075. (Action, p. 5). This paragraphs describe the processing of data from a number of photoregistrars.

[0074] As shown in FIG. 6, digital image data from each of the one or more photoregistrars is passed to at least one signal processor 660A-660N. Each signal processor 660A-660N recognizes and processes one version of distorted patterns, such as an aperiodic system of strips. The coding sequence for the pattern of structured illumination may depend on the pattern projected by SLM devices 515A-515N of FIG. 5. For instance, in a system utilizing aperiodic strips, a "1" may be generated when a line is present, and when a line is absent, a "0" may be produced. The output of this exemplary coding sequence is shown in FIGS. 7a and 7b. Consistent with the present invention, the system may, however, utilize other patterns or types of structured light, such as a grid pattern. In addition, other coding schemes for coding the distorted patterns may be utilized.

[0075] The resultant processed digital signal such as reconstructed 3D topology from signal processors 660A-660N may be accumulated in electronic unit 690. For example, processor 670 of electronic unit 690 may sum the signals received from each of signal processors 660A-660N to create a "overall" digital image. In addition to summarizing the binary signals, processor 670 may determine the coordinates values (X,Y) of the object's surface. As a result, each line (or strip) in the "overall" digital image may have a unique number in binary code. Based on the summarized codes, processor 670 can then calculate the distance, Z, and corresponding pairs of coordinates because distances between the strips forming structural illumination differ on the registered picture. Portal Recognition System  
(Yukhin, paragraphs 0074-0075).

Applicant notes that the result described is an “overall” digital image. However, Yukhin never teaches or suggests the claimed “combin[ation of] said separate color image data sets into a

composite Rainbow-type image of said object.” (Emphasis added). Therefore, for at least this additional reason, the rejection of claim 35 should be reconsidered and withdrawn.

Claim 61:

Claim 61 recites “a computing device communicatively coupled to said image sensor, wherein said computing device further comprises a mosaic means configured to combine said three separate color image data sets to form a multi-view 3D image of said object.” As cited above, Yukhin does not teach or suggest mosaic means combining three separate color image data sets to form a 3D image of an object. Rather, Yukhin works on entirely different principles. For at least this additional reason, the rejection of claim 61 should be reconsidered and withdrawn.

Claim 62:

Claim 62 recites “wherein each of said 3 CCD monochromatic sensors comprise a matched narrow-band spectral filter disposed in front of said CCD sensor.” According to the Action, this subject matter is taught by Yukhin in the form of a “beam splitter 615.” (Action, p. 6). This is clearly incorrect.

Claim 62 recites three separate narrow-band spectral filters respectively disposed in front of three CCD monochromatic sensor. A beam splitter is not a narrow-band spectral filter. A single beam splitter is not three separate narrow-band spectral filters, as claimed. For at least this additional reason, the rejection of claim 62 should not be sustained.

New Claims:

The newly added claim is thought to be patentable over the prior art of record for at least the same reasons given above with respect to the original independent claims. Therefore, examination and allowance of the newly added claim is respectfully requested.

Conclusion:

In view of the foregoing arguments, all claims are believed to be in condition for allowance over the prior art of record. Therefore, this response is believed to be a complete response to the Office Action. However, Applicant reserves the right to set forth further arguments in future papers supporting the patentability of any of the claims, including the separate patentability of the dependent claims not explicitly addressed herein. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed.

The absence of a reply to a specific rejection, issue or comment in the Office Action does not signify agreement with or concession of that rejection, issue or comment. Non-finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment. Further, for any instances in which the Examiner took Official Notice in the Office Action, Applicants expressly do not acquiesce to the taking of Official Notice, and respectfully request that the Examiner provide an affidavit to support the Official Notice taken in the next Office Action, as required by 37 CFR 1.104(d)(2) and MPEP § 2144.03.

If the Examiner has any comments or suggestions which could place this application in better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

If any fees are owed in connection with this paper that have not been elsewhere authorized, authorization is hereby given to charge those fees to Deposit Account 18-0013 in the name of Rader, Fishman & Grauer PLLC.

Respectfully submitted,

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